{In Archive} PAG vs MCL vs 10-4 comparison in Chart Form

Stuart Walker to: David Huber 03/10/2010 08:58 PM
Cc: Elizabeth Southerland, Helen Dawson

From: Stuart Walker/DC/USEPA/US
To: David Huber/DC/USEPA/US@EPA,
Cc: Elizabeth Southerland/DC/USEPA/US@EPA, Helen Dawson/DC/USEPA/US@EPA
Archive: This message is being viewed in an archive.

Because you thought my PAG vs MCL vs 10-4 comparison might be easier to understand in a chart form, here are 2 charts that show the comparison. Its in log scale. The radionuclides are in order of atomic weight, just like in the PAG document.

Charts Comparing PAG to 10-4 and MCL.pdf
----- Forwarded by Stuart Walker/DC/USEPA/US on 03/10/2010 08:55 PM -----

From: Stuart Walker/DC/USEPA/US
To: David Huber/DC/USEPA/US@EPA
Date: 03/04/2010 08:11 PM
Subject: Fw: my analysis of drinking water PAG

My 123 analysis scanned without all the extra pages.
[attachment "PAGs_vs_Risk_vs_MCL_123_Comparison.pdf" deleted by Stuart Walker/DC/USEPA/US]
----- Forwarded by Stuart Walker/DC/USEPA/US on 03/04/2010 08:06 PM -----

From: Stuart Walker/DC/USEPA/US
To: David Huber/DC/USEPA/US@EPA
Date: 03/04/2010 06:57 PM
Subject: Fw: my analysis of drinking water PAG

scanned in copy of my Lotus 123 files
[attachment "[Untitled].pdf" deleted by Stuart Walker/DC/USEPA/US]
----- Forwarded by Stuart Walker/DC/USEPA/US on 03/04/2010 06:55 PM -----

From: Stuart Walker/DC/USEPA/US
To: David Huber/DC/USEPA/US@EPA
Date: 03/04/2010 06:41 PM
Subject: my analysis of drinking water PAG

----- Forwarded by Stuart Walker/DC/USEPA/US on 03/04/2010 06:40 PM -----

From: Stuart Walker/DC/USEPA/US
To: Sara DeCair/DC/USEPA/US@EPA
Cc: Doug Ammon/DC/USEPA/US@EPA, Colby Stanton/DC/USEPA/US@EPA, Elizabeth Southerland/DC/USEPA/US@EPA, Juan Reyes/DC/USEPA/US@EPA
Date: 05/15/2007 06:04 PM
Subject: Re: ACTION REQ'D: Five-week review of PAG Manual

Hi Sara,

Thanks for providing us an opportunity to review the latest draft of the ORIA PAGs. OSRTI does not have any showstoppers. We request that you let us review a redline/~~strikeout~~ version of the next draft after you incorporate comments from the workgroup.

Since, this is the first draft of the ORIA PAG to include concentrations for the drinking water and food interdiction PAGs, we are submitting revised substantive comments on both those PAGs from our comments on the last draft. Our comments on both the drinking water and food interdiction PAGs include a comparison of the PAG concentrations to risk based concentrations, and in the case of the drinking water PAGs, MCLs. These comparisons are similar to the comments I sent Ed Tupin 3-4-2004 on an early draft of the water PAGs.
[attachment "OSRTI comment on ORIA PAGsApril2007v1.doc" deleted by Stuart Walker/DC/USEPA/US]

Below is further explanaition of the analysis discussed in the comments on the water and food PAGs.

Water PAGs

Chronic effects

I put together 3 Lotus 123 Tables comparing ORIA's PAG concentrations to MCLs and concentrations corresponding to a 1 x 10-4 cancer risk. I used MCLs and 10-4 since these are measures EPA utilizes when making decisions about providing bottled water during emergencies involving class A carcinogens. I noticed that a number of the ORIA PAG concentrations are thousands of times higher than the MCLs or 1 x 10-4 (a few are over a hundred thousand times higher). This is not evident without looking at the concentrations since the MCL for most radionuclides is 4 mrem/yr and the PAG is 500 mrem/yr. However, I understand that different science may have something to do with it since the MCL is based on ICRP 2 methodology and the PAG is ICRP 60/72 methodology, however the 1 x 10-4 risk based concentrations are also based on ICRP 60/72.

Here is an explanation of the comparison tables I put together on the water PAGs and the 3 tables themselves.
[attachment "2007ExplainCompareTables.pdf" deleted by Stuart Walker/DC/USEPA/US] [attachment "2007CompareTable_byRisk.123" deleted by Stuart Walker/DC/USEPA/US] [attachment "2007CompareTable_byMCL.123" deleted by Stuart Walker/DC/USEPA/US] [attachment "2007CompareTable_byRad.123" deleted by Stuart Walker/DC/USEPA/US]

Subchronic effects

It also appears that drinking water at the PAG concentrations for Te-129 and Te-127 may lead to subchronic (acute) effects acute following exposures of a day or a week. In a population, one should see some express of acute effects (not deaths) above 0.25 Gy (25 rad) - that is, vomiting, fever etc. The Te-129 absorbed dose at 1 week was 1.8 Gy (180 rad) for 14 L intake. For these two radionuclides, an acute radiation syndrome (ARS) involving the GI-tract is indicated. Acute dose coefficients for a 30 d period were calculated for the adult using the AcutDose. This analysis focused only on the 16 radionuclides where drinking water at the PAG concentration for 1 week or less would exceed the amount of radioactivity received from drinking a 1 x 10-4 cancer risk level assuming 70 years of exposure.

Food PAGs

I also put together 3 Lotus 123 Tables comparing ORIA's food PAG concentrations that were adopted from FDA to concentrations corresponding to a 1 x 10-4 cancer risk. I used 10-4 since the food interdiction situation is somewhat analogous to the decision of when to provide drinking water. I noticed that some of the ORIA PAG concentrations are hundreds, even thousands of times higher than the MCLs or 1 x 10-4 .

Here is an explanation of the comparison tables I put together on the food PAGs and the 3 tables themselves.
[attachment "2007ExplainCompareFOODTables.pdf" deleted by Stuart Walker/DC/USEPA/US]
[attachment "2007CompareFoodTable_convertPRG.123" deleted by Stuart Walker/DC/USEPA/US]
[attachment "2007CompareFoodTable.123" deleted by Stuart Walker/DC/USEPA/US] [attachment "2007CompareFoodTable_byRad.123" deleted by Stuart Walker/DC/USEPA/US]
Sara DeCair/DC/USEPA/US

Sara DeCair/DC/USEPA/US
04/10/2007 10:26 AM

To Andrew.Wallo@eh.doe.gov, cmw6@cdc.gov, cym3@cdc.gov, Kenneth.Wierman@dhs.gov, man@cdrh.fda.gov, pxm@nrc.gov, paul.nelson@dtra.mil, pxs@cdrh.fda.gov, stanton.colby@epa.gov, Sara DeCair/DC/USEPA/US@EPA, stephen.domotor@eh.doe.gov, sam2@nrc.gov, Dan.Wilcox@dhs.gov, Vanessa.Quinn@dhs.gov, william.cunningham@nist.gov, walker.stuart@epa.gov, ammon.doug@epa.gov, schumann.jean@epa.gov, Ferris.John@dol.gov, druedy@endyna.com, itasker@endyna.com, siddhanti@endyna.com, asa4@CDC.GOV, Jack.Patterson@rss.usda.gov, John Cardarelli/CI/USEPA/US@EPA, Scott Hudson/CI/USEPA/US@EPA, Colleen Petullo/LV/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, ksteves@kdhe.state.ks.us, jim_hardeman@dnr.state.ga.us, debra.mcbaugh@doh.wa.gov, elzermam@michigan.gov, yalek@michigan.gov, Jessica Wieder/DC/USEPA/US@EPA, dschneider@scainc.com, Robert Dye/ARTD/R7/USEPA/US@EPA, CharlesA Hooper/ARTD/R7/USEPA/US@EPA, Roger Goodman/DC/USEPA/US@EPA, craig.conklin@dhs.gov, John Mackinney/DC/USEPA/US@EPA, tdkraus@sandia.gov, Mike Boyd/DC/USEPA/US@EPA, Neal Nelson/DC/USEPA/US@EPA, Lowell Ralston/DC/USEPA/US@EPA, Rick Poeton/R10/USEPA/US@EPA, boyd.wesley@epa.gov, Scott Telofski/MTG/USEPA/US@EPA, Roger Goodman/DC/USEPA/US@EPA

cc Mike Boyd/DC/USEPA/US@EPA, Neal Nelson/DC/USEPA/US@EPA, Lowell Ralston/DC/USEPA/US@EPA, Rick Poeton/R10/USEPA/US@EPA, boyd.wesley@epa.gov

Subject ACTION REQ'D: Five-week review of PAG Manual

PAGs Reviewers;

It is time for the final federal review, via FRPCC, of the PAG Manual prior to going into the Federal Register for public comment! This is a SHOWSTOPPERS ONLY review and we are asking for you to obtain your agency or department's (or your AA-ship's within EPA) buy-in on this Manual so we can release it. The five weeks start on April 10th and end on May 15th. Your showstopper comments are due no later than May 15th.

A showstopper is defined as a statement or concept that your agency or department sees as so problematic that we cannot release the Manual for public comment. Since this is the last of several rounds of review, we hope there will not be any such issues. Note that I will be checking in with you over the next few weeks to check on your progress and to see if you have any questions or potential showstoppers.

After this review and our incorporation of any final changes, I will submit the final draft Manual to my management in the Office of Air and Radiation along with the final draft FR Notice of Availability for approval. We plan to issue the FR Notice in June and provide a 60-day comment period.

To access the document:
Go to the contractor's FTP site at: ftp://205.158.69.157/
User name: clients Password: welcometoendyna
In the EPA ORIA folder, you will find both Word and PDF versions -- I suggest you print from the Word version with 'View, Markup' turned OFF.

Attachments:
- A suggested re-organization for Chapter 6 that may improve readability
- Comment form
- Draft FR Notice of Availability (please provide any input you have, this is not subject to the 'showstoppers only' rule!)

Thank you for all your input and support on this project, and I look forward to hearing from all of you,

Sara D. DeCair, Health Physicist
www.epa.gov/radiation/rert/pags.htm
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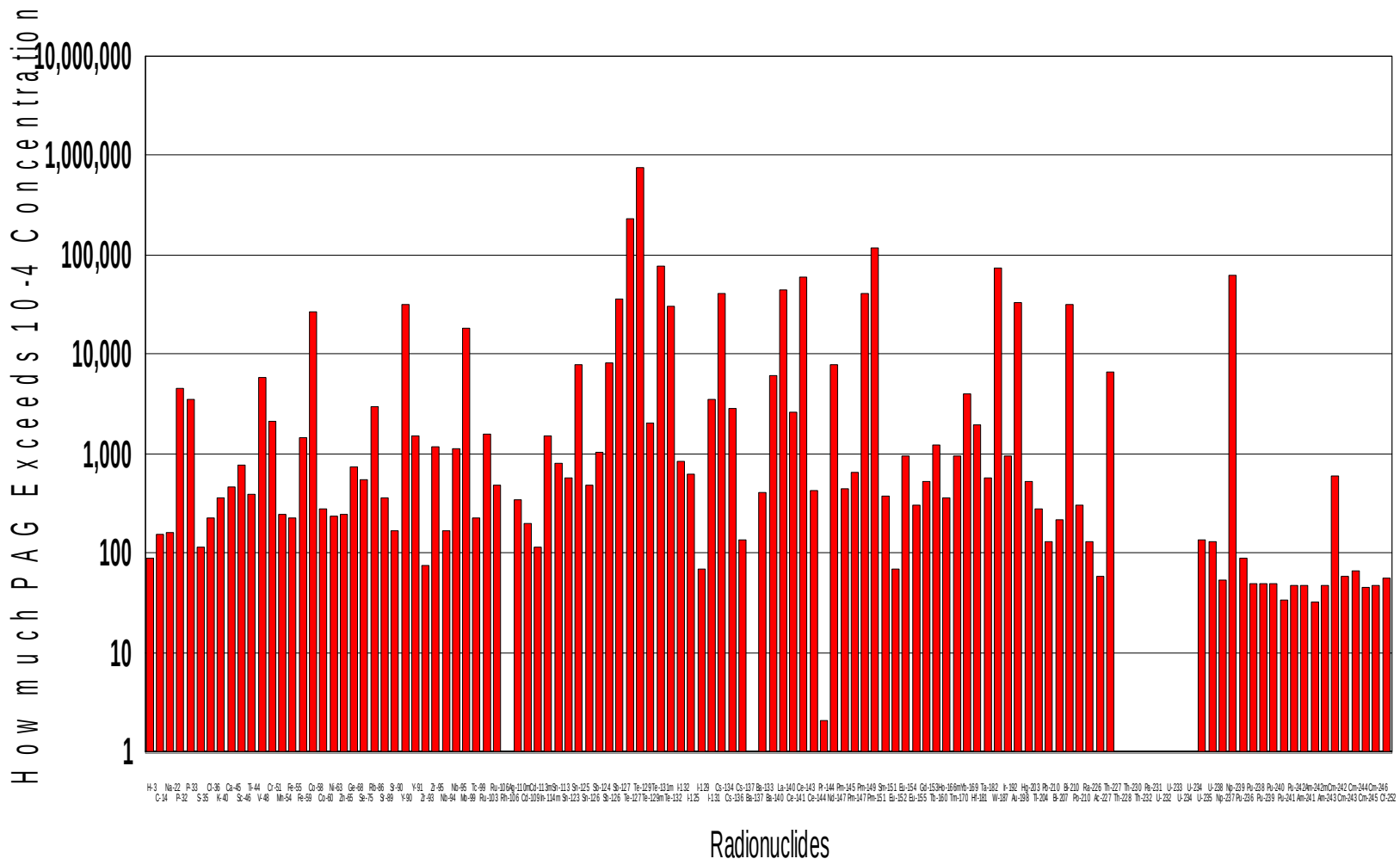
[attachment "A suggested layout for Chapter 6.doc" deleted by Stuart Walker/DC/USEPA/US] [attachment "Showstoppers Comment Form.doc" deleted by Stuart Walker/DC/USEPA/US] [attachment "FR Notice draft 3-27-2007.doc" deleted by Stuart Walker/DC/USEPA/US]

Comparison of Drinking Water PAG to 1 x 10-4 Concentrations



Comparison of Drinking Water PAG to MCL